



General Certificate of Education
Advanced Level Examination
June 2011

Physics

PHY6T/P11/TN

Unit 6 Investigative and Practical Skills in A Level Physics

Investigative Skills Assignment (ISA) P

Instructions to Supervisors

Confidential

- These instructions are provided to enable centres to make appropriate arrangements for the Unit 6 ISA P test.
- For further details of the administration of the ISA and for information about these instructions, please see the document *Guidance Instructions for the Administration of Investigative Skills Assignment (ISA): GCE Physics*.

ISA (P) SHM Oscillations of a spring

Centre Instructions for the Investigation

In this ISA, candidates will be investigating the simple harmonic motion of a spring attached to a hinged metre ruler with masses attached. Candidates will be required to investigate the relationship between the time period of the oscillations and mass.

Information for centres

Candidates can be told about one week before undertaking Stage 1 of the ISA that they will be investigating the simple harmonic motion of a mass-spring system.

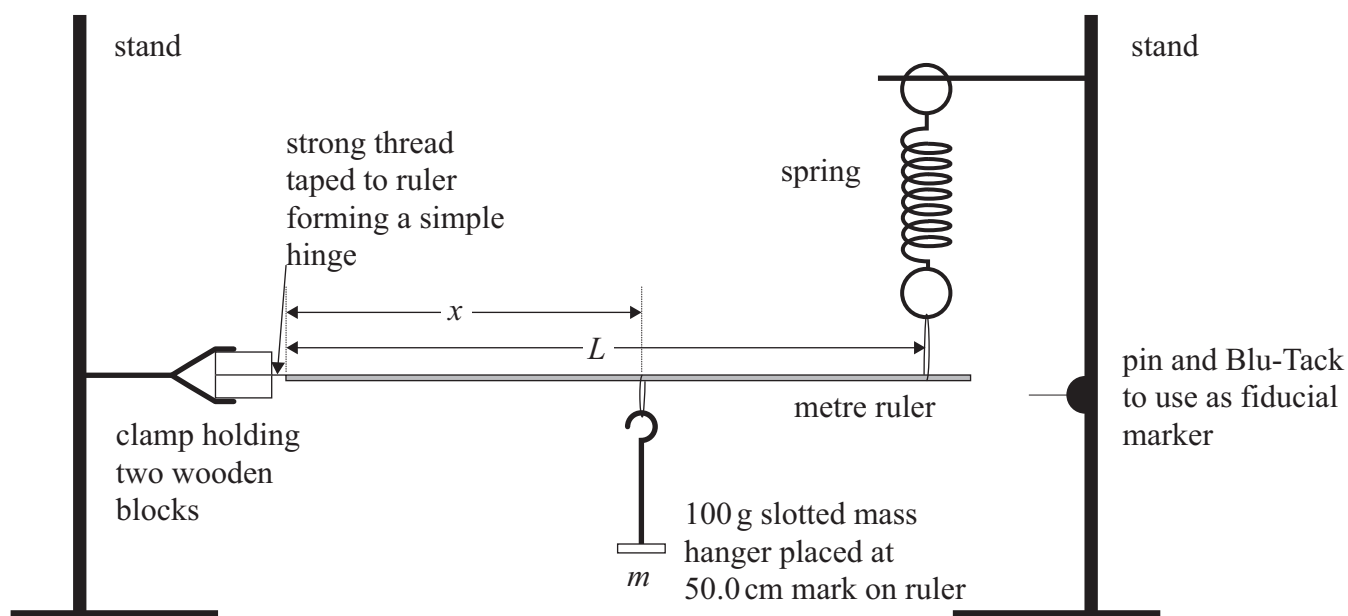
Stage 2 of the ISA (the written test: Sections A and B) should take place as soon as possible after Stage 1.

Apparatus

Centres should ensure that the apparatus provided can be used safely. Each candidate will need:

- (a) 2 retort stands with clamps and bosses
- (b) wooden metre ruler
- (c) steel spring to support oscillating system with up to 700 g mass without exceeding its elastic limit. Spring constant $20 - 30 \text{ N m}^{-1}$ (eg Philip Harris expendable steel springs, item code B8G87194)
- (d) stopclock or stopwatch (precision at least $\pm 0.01 \text{ s}$)
- (e) strong thread for taping to end of ruler to form hinge
- (f) wooden blocks to trap the thread that is attached to the ruler
- (g) wire loops fitted around ruler to attach to mass holder and spring
- (h) pin and Blu-Tack to use as fiducial (reference) marker
- (i) six 100 g slotted masses and 100 g mass holder
- (j) set-square
- (k) additional metre ruler or half-metre ruler (any type).

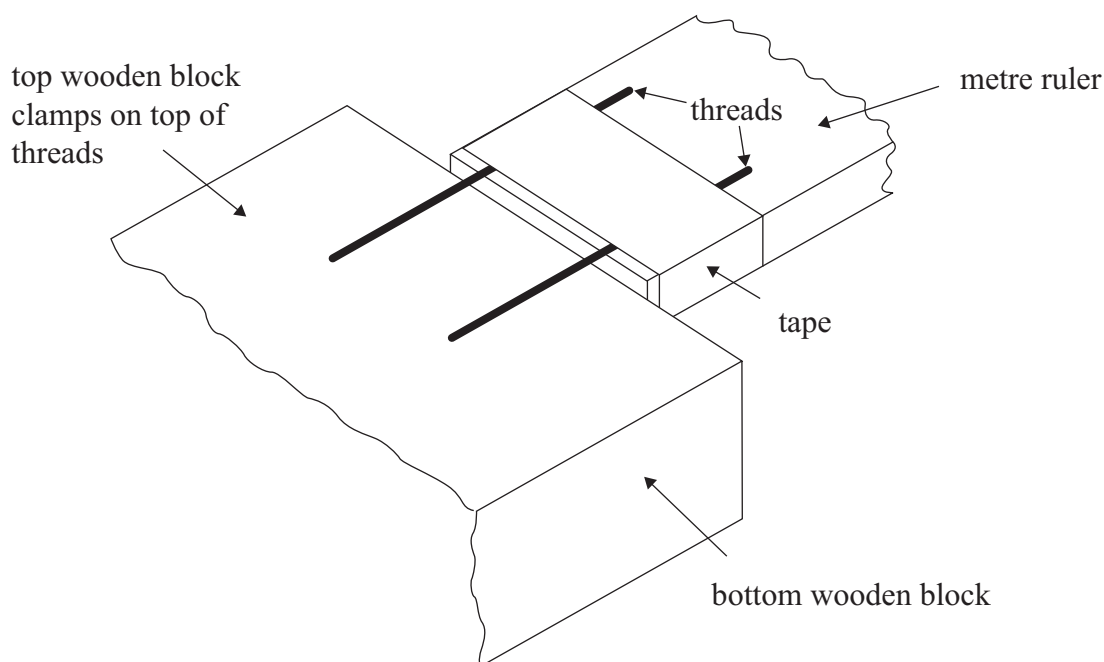
Figure 1



The apparatus will be set up by candidates as shown in **Figure 1**.

Two threads should be taped to the end of the metre ruler as shown below.

Figure 2



Candidates will be required to clamp the two threads between the wooden blocks. This allows free movement as the ruler oscillates. Candidates will be instructed to set up the apparatus as shown, suspending the masses from the 50.0 cm mark on the ruler and attaching the spring at the 90.0 cm mark on the ruler. They will also have to ensure that the ruler is horizontal and the spring vertical, using the other ruler and set-square.